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# *Camellia debaoensis* (Theaceae), a new species of yellow camellia from limestone karsts in southwestern China

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## Abstract

*Camellia debaoensis* R.C.Hu & Y.Q.Liufu, **sp. nov.** is described and illustrated as a new species from southwestern Guangxi, China. It is morphologically similar to *Camellia pubipetala* Y. Wan & S. Z. Huang, *C. mingii* S.X. Yang and *C. tuyenquangensis* D.V. Luong, N.N.H. Le & N. Tran, but it differs from these species in having glabrous young branches, glabrous petiole, glabrous sepals, glabrous petals, glabrous stamens and glabrous ovary, 10 petals, cylindrical ovary and style 3-lobed to 1/6 style length.

## Keywords

*Camellia*, China, limestone flora, taxonomy, Theaceae

## Introduction

Guangxi Zhuang Autonomous Region of southern China is an area noted for its karst landscapes (Hou et al. 2010). The limestone region in southwestern Guangxi harbors very high levels of biological diversity and is recognized as one of 20 centers of plant endemism in China (Myers et al. 2000, López-Pujol et al. 2011). Yellow camellia, a subgroup of *Camellia* (Theaceae), are characterized by yellow, waxy and shiny petals (Chang and Ren 1998). Because of their beautiful flowers and useful chemical constituents, yellow camellias have considerable economic value in breeding, as well as traditional Chinese medicine and commercial tea production (He et al. 2016). Before 2007, fewer than

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20 yellow camellias from China were recognized, according to the literatures (Ye and Xu 1992; Chang and Ren 1998; Min 2000; Min and Bruce 2007). Most of them are only distributed in southwestern Guangxi, which had been considered as a center of diversity of the yellow camellia. In recent years, many new species of yellow camellia have been reported from northern Vietnam and southern China (e.g. Tran and Nguyet 2005; Orel 2006; Orel and Wilson 2010, 2012; Orel et al. 2012, 2013, 2014a, b; Tran et al. 2012; Tran and Luong 2013; Huang et al. 2014; Orel and Curry 2015; Tran and Le 2015; Luu et al. 2015; Dung et al. 2016; Luong and Le 2016; Luong et al. 2016a, b; Le et al. 2017; Nguyen et al. 2018; Liu et al. 2019), increasing the total to more than 50 species (Tran et al. 2019) and making northern Vietnam another center of yellow camellia diversity. Generally, yellow camellias are rare and highly endemic due to their small population, narrow distribution and excessive gathering. Recently, almost all Chinese yellow camellia species were categorized as Critically Endangered, Endangered, or Vulnerable species in the Threatened Species List of China's Higher Plants (Qin et al. 2017).

During our floristic survey in limestone karsts of Debao County, southwestern Guangxi, in 2015, we collected several specimens from a population of *Camellia* with yellow flowers. In the following three years, this population was documented for flowering and fruiting regularly at the same locality. Morphological comparison between the newly collected specimens and other yellow camellias suggested that the specimens from Debao differed from all the previously described species. Therefore, we here describe this material as a new species.

## Materials and methods

Several specimens were collected at the entrance of one of the karst caves of Debao County, Jingde Town, Tuoliang village from 2015 to 2018, and were deposited in the herbaria GXMI, IBK, NHMG, KUN. The morpho-photographs of the plants were taken with a Panasonic LX100 camera. This material was confirmed as a new species based on detailed comparison with all other heretofore known yellow camellias, including specimens deposited at PE, KUN, IBSC, IBK, GXMI, HIB, SYS, GXMG, and description from botanical websites (e.g. http://www.cvh.ac.cn/, https://plants.jstor.org/). Herbarium acronyms follow Thiers (2018). The morphological characters were measured using M & G ARL96004.

## Taxonomic treatment

***Camellia debaoensis*** **R.C.Hu & Y.Q.Liufu, sp. nov.**
urn:lsid:ipni.org:names:77203187-1
Figs 1, 2

**Diagnosis.** Morphologically, the new species is similar to *Camellia pubipetala* Y. Wan & S.Z. Huang, *C. mingii* S.X. Yang and *C. tuyenquangensis* D.V. Luong, N.N.H. Le &

N. Tran, but it differs from these species in having glabrous young branches, glabrous petiole, glabrous sepals, glabrous petals, glabrous stamens and glabrous ovary, 10 petals, cylindrical ovary and 3-lobed to 1/6 style length.

**Type.** **China.** Guangxi Zhuang Autonomous Region: Debao County, Jingde Town, Tuoliang village, at the entrance of one of karst caves, rare, 23°29'23.12"N, 106°9'47.27"E, 760 m a.s.l., 13 January 2017 (fl.), *R.C. Hu HRC170113002* (holotype: GXMI!, isotypes: GXMI!, KUN!, NHMG! and IBK!).

**Description.** Shrubs, 1–3 m tall. Young branches cylindrical, thick, glabrous, yellowish brown or grayish brown, and current year branchlets purplish red. Leaf blade leathery, ovate to long ovate, 6–13 × 3–5 cm, adaxial surface dark green and glabrous, abaxial surface pale green, brown glandular punctuate and veins sparsely spreading villous, veins abaxially elevated and adaxially impressed, secondary veins 5–6 on each side of midvein and connected at the proximal edge, base cuneate to broadly cuneate, apex caudate tip, margin serrulate; petiole 5–12 mm long, glabrous. Flowers subterminal axillary, solitary, 3–4.5 cm diam. Pedicel ca. 4(–6) mm long, thick; bracteoles 4 (or 5), unequal, 1–3 × 2–4 mm, appressed and covering pedicel, oval-triangle, leathery, green and glabrous, margin ciliolate. Sepals 5 (–6), semiorbicular to broadly ovate, 3–5 × 5–8 mm, leathery, glabrous, lightly yellow and occasionally with pink patches, fruiting stage green, margin ciliolate. Petals 10, in three whorls of 3–4 petals, golden yellow, glabrous; outer 3 or 4 petals suborbicular, occasionally with pink patches, 0.7–1.1 × 1 cm; inner orbicular-ovate or oval, 1.2–1.8 × 1.2–2.6 cm, basally connate for 1–3 mm. Stamens numerous, glabrous, ca. 2 cm long; anthers ca. 3 × 1mm; outer filaments connate ca. basal 1/4, ca. 1.6 cm, inner filaments nearly distinct, ca. 1.7 cm. Ovary cylindrical, ca. 2 mm in diam., glabrous, 3-loculed; style 2 cm long, glabrous, base connate, apex 3-lobed to 1/6 style length. Capsule triangle oblate, glabrous, 1.4–1.6 × 1.6–2.8 cm; Seeds brown, hemispherical, pubescent.

**Phenology.** Flowering from December to February of the next year; fruiting from July to August.

**Distribution and habitat.** *Camellia debaoensis* grows at the entrance of one of the limestone caves in the karst region of Debao County (Fig. 3), Guangxi, China, accompanied by *Ageratina adenophora* (Sprengel) R. M. King & H. Robinson (Compositae), *Boehmeria penduliflora* Wedd. ex Long (Urticaceae), *Fallopia multiflora* (Thunb.) Harald (Polygonaceae), *Flueggea virosa* (Roxb. ex Willd.) Voigt (Euphorbiaceae), *Pteris vittata* L. (Pteridaceae), *Ficus tikoua* Bur (Moraceae), and *Pueraria montana* (Lour.) Merr. var. *lobata* (Willd.) Maesen et S. M. Almeida ex Sanjappa et Predeep (Fabaceae).

**Conservation status.** According to currently available data, *Camellia debaoensis* is only found in its type locality and there are only nine adult trees and four saplings, with the distribution restricted to a very limited region (less than 200 $m^2$). Considering this situation, we consider *Camellia debaoensis* as 'Critically Endangered' (CR) based on the IUCN categories and criteria (IUCN 2017).

**Additional specimens examined.** China. Guangxi Zhuang Autonomous Region: Debao County, Jingde Town, Tuoliang village, at the entrance of karst cave, rare, ca. 760 m a.s.l., 13 Jan. 2017 (fl.), *R.C. Hu HRC170113001* (GXMI!); the same locality, 21 May 2016 (fr.), *R.C. Hu HRC170521001*(GXMI!); the same locality, 25 Dec. 2015 (fl.), *R.C. Hu & Y.Q. Liufu HRC151225023* (GXMI!).

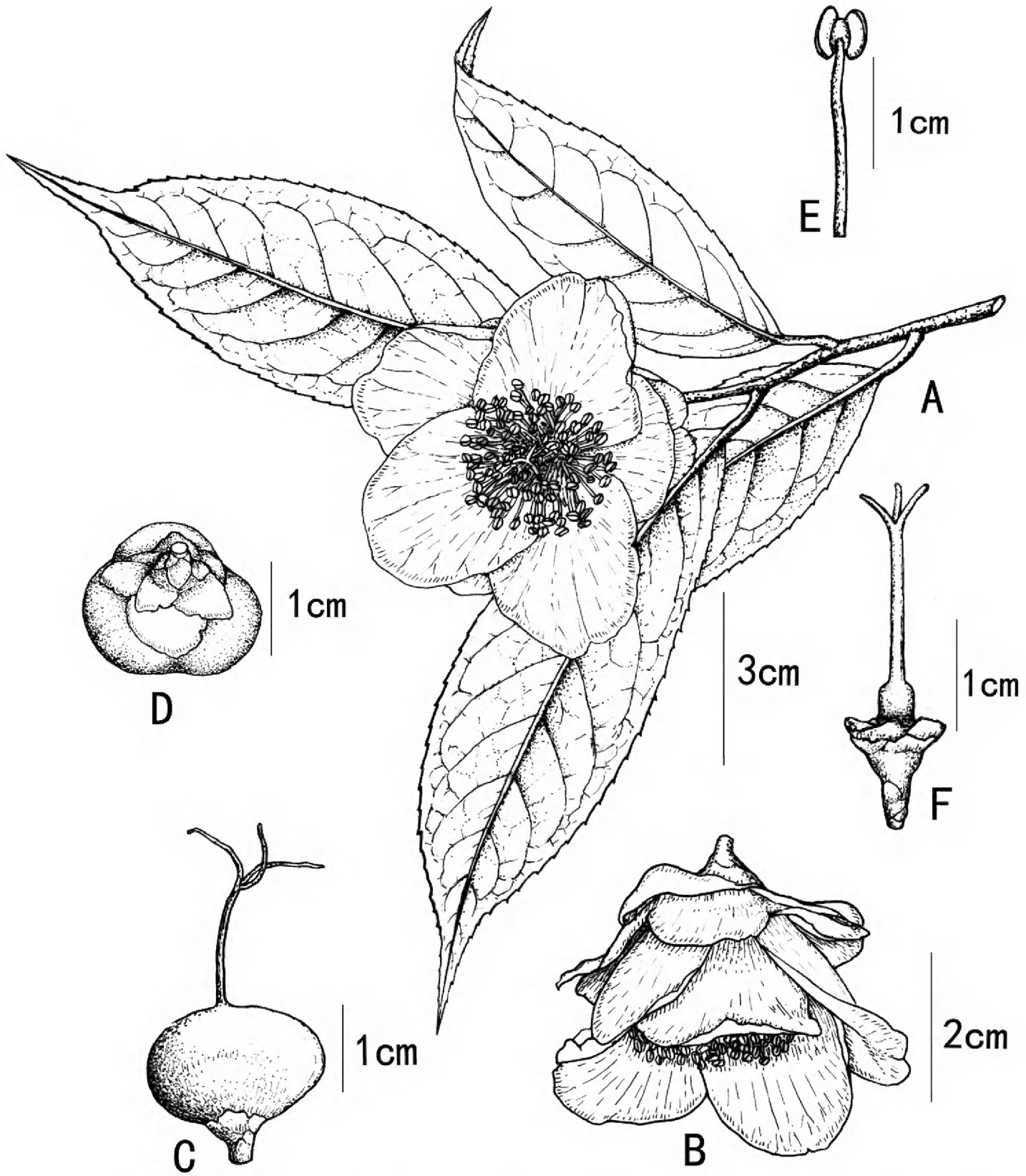


**Figure 1.** *Camellia debaoensis* R.C.Hu & Y.Q.Liufu, sp. nov. **A** flowering branch **B** lateral view of flower **C** fruit and style **D** fruit, sepals and bracteoles **E** stamen **F** pistil. Drawn by Xincheng Qu.

**Etymology.** The specific epithet is derived from the type locality, Debao County, Guangxi.

**Taxonomic notes.** It is noted that there are several classification systems about taxonomic treatments of *Camellia*, represented by Ye and Xu (1992), Chang and Ren (1998), and Min and Bruce (2007). These systems have different taxonomic opinions on sectional taxonomic treatment of yellow camellias. Considering the inclusiveness of the system of Min and Bruce (2007), the new species should be placed in *C.* sect. *Stereocarpus*.

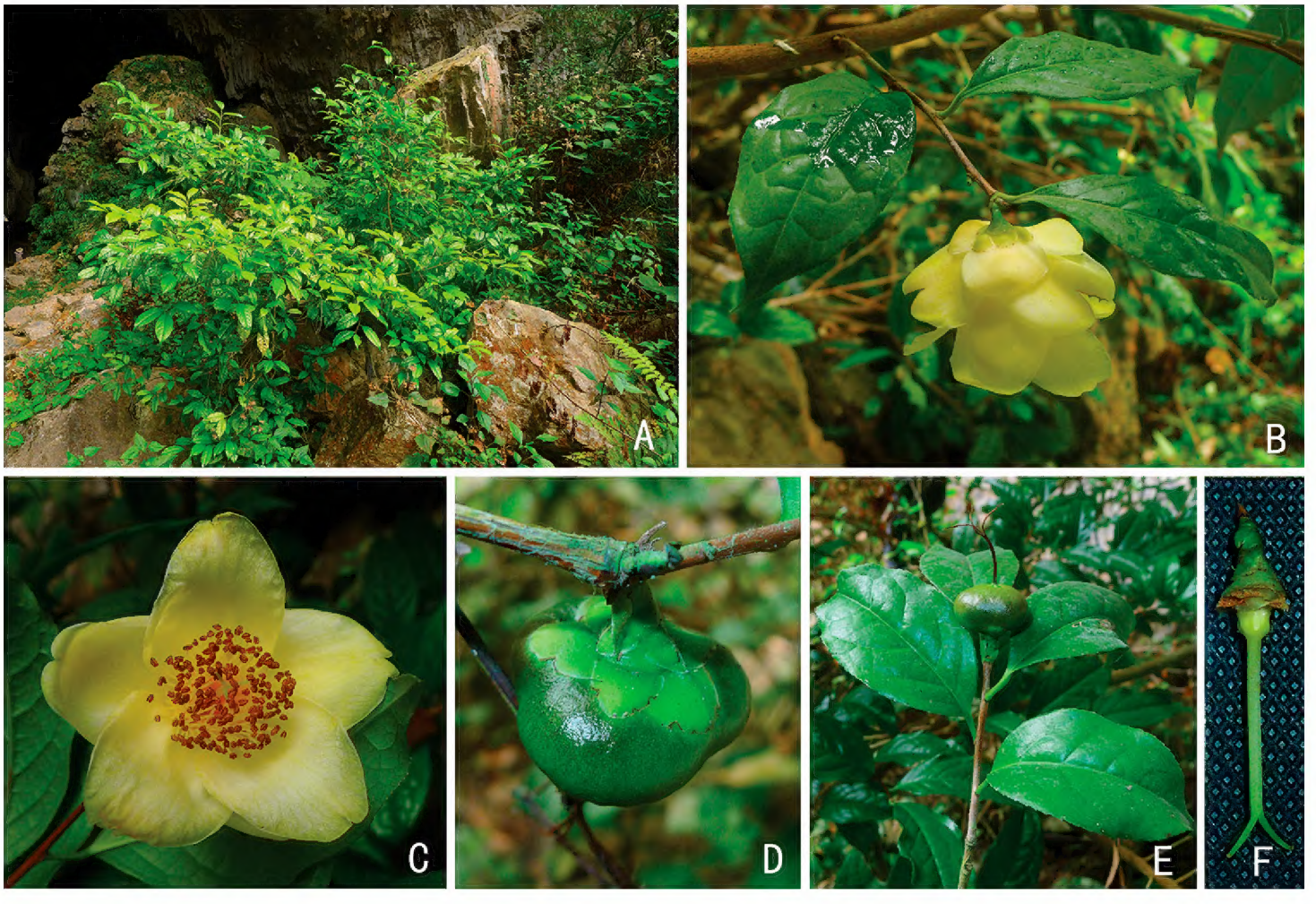


**Figure 2.** *Camellia debaoensis* R.C.Hu & Y.Q.Liufu, sp. nov. **A** habit **B** flowering branch **C** face view of flower **D** fruit, sepals and bracteoles **E** fruiting branch **F** pistil. Photographed by Renchuan Hu.

**Figure 3.** Map showing distribution of *Camellia debaoensis* R.C.Hu & Y.Q.Liufu, sp. nov. in southwestern Guangxi, China.

**Table 1.** Morphological comparison of *C. debaoensis* with other yellow camellias with connate style. Data from Min and Bruce (2007), Orel and Wilson (2010), Orel et al. (2013, 2014a), Luong et al. (2016a, b), Le et al. (2017), Liu et al. (2019).

| Taxon | Section | Leaf shape, leaf size | Pedicel length | No. of bracts | No. of petals | Style, extent to which cleft, hairiness | Ovary, carpels, hairiness | Filaments morphology |
|---|---|---|---|---|---|---|---|---|
| *C. capitata* | *Capitatae* | Elliptic to oval, 24.0–27.0 × 10.0–12.0 cm | Sessile | 8–10 | 6 | Apex 3-lobed, apically cleft for 1–2 mm, glabrous | 3-carpellate, glabrous | Glabrous, outer filaments basally attached to inner petals for ca. 10 mm |
| *C. luteocerata* | *Dalatia* | Elliptic to broadly elliptic, 22.0–27.5 × 9.0–11.0 cm | Sessile | 6 | 11–13 | Apex 5-lobed, apically cleft to 1/3 style length, glabrous | 5-carpellate, glabrous | Glabrous, filaments basally connate for 1/3 of their length, and partially joined to the inner petals |
| *C. bugiamapensis* | *Dalatia* | Elliptic, oval to widely elliptic, 18.0–27.5 × 12.0–14.0 (–15.0) cm | Sessile | 7 | 9–11 | Apex 5-lobed, apically shortly lobed, white hairs | 5–6-carpellate, glabrous | Glabrous, outer filaments basally attach to inner petals for 20–25 mm |
| *C. luteopallida* | *Dalatia* | Elliptic to ovate, 16.0–20.0 × 5.0–9.0 cm | Sessile | 6–9 | 12–14 | Apex 3-lobed, apically cleft 3–6 mm, dense white hairs | 3-carpellate, glabrous | Sparely hairy, filaments basally united to each other to form a 10–13 mm fleshy tube |
| *C. tuyenquangensis* | *Chrysantha* | Oblong ovate to narrow elliptic, 14.0–18.0 × 5.0–8.0 cm | 10 mm | 4–5 | 12 | Apex 3-lobed, apically cleft to 1/2 style length, glabrous | 3-carpellate, glabrous | Glabrous, outer filament whole basally connate for 10–14 mm, adnate to petal base |
| *C. thuongiana* | *Chrysantha* | Elliptic to oblong elliptic, 9.0–17.0 × 4.0–6.5 cm | 8–10 mm | 3–4 | 11–13 | Apex 3-lobed, apically cleft to 1/2 style length, glabrous | 3-carpellate, pubescent | Glabrous, outer filaments basally connate for 4–5 mm |
| *C. oconoriana* | *Chrysantha* | Narrowly elliptic, 30.0–36.5 × 8.0–8.5 cm | 30–40 mm | 6 | 6 | Apex 3–5-lobed, apically cleft 9–11 mm, finely hairy proximally, glabrous distally | 4–5-carpellate, densely tomentose | Glabrous, outer filaments basally connate for ca. 6 mm |
| *C. pubipetala* | *Stereocarpus* | Elliptic to ovate, 10.0–17.0 × 5.0–8.0 cm | Subsessile | (4–)6–8 | 9–13 | Apex 3(or 4)-lobed, apically cleft 5–10 mm, tomentose | 3(or 4)-loculed, yellowish tomentose | Distinct part pilose, outer filament whorl basally connate for ca. 1/3 of its length |
| *C. mingii* | *Stereocarpus* | Elliptic-ovate to narrowly ovate, 10.0–15.0 × 4.0–6.0 cm | 3–6 mm | 4 or 5 | 12 or 13 | Apex 3-lobed, apically cleft ca.2–3 mm, glabrous or sparsely pubescent | 3-carpellate, densely tomentose | Puberulent, outer filaments basally connate for ca. 1/2 of their length |
| *C. debaoensis* | *Stereocarpus* | Oval to long oval, 6.0–13.0 × 2.5–5.0 cm | 4(–6) mm | 4 (or 5) | 10 | Apex 3-lobed, apically cleft to 1/6 style length, glabrous | 3-carpellate, glabrous | Glabrous, outer filaments basally connate for ca. 1/4 of their length |

*Camellia debaoensis* resembles many other yellow-flowering camellia species with connate style, such as *Camellia pubipetala* Y. Wan & S.Z. Huang, *C. mingii* S.X. Yang, *C. tuyenquangensis* D.V. Luong, N.N.H. Le & N. Tran, *C. oconariana* Orel, Curry & Luu, *C. thuongiana* Luong, Anna Le & Lau, *C. luteocerata* Orel, *C. luteopallida* Luong, T.Q.T. Nguyen & Luu, *C. bugiamapensis* Orel, Curry, Luu & Q.D. Nguyen and *C. capitata* Orel, Curry & Luu. These species are placed in various sections within the genus including sections *Stereocarpus* Chang, *Chrysantha* Chang, *Dalatia* Orel and *Capitatae* Orel (Table 1). A key to identifying species of yellow camellia with connate style is provided below. Of these species, the new species is more similar to *C. pubipetala*, *C. mingii*, *C. tuyenquangensis* than to other species by sharing small leaflets, subterminal axillary flowers, 9–13 petals, differentiated bracts, outer filament whorl basally connate, 3-locular ovary, connate style. However, it is well distinguished from these species in having glabrous young branches, glabrous petiole, glabrous sepals, glabrous petals, glabrous stamens and a glabrous ovary (vs. villous in *C. pubipetala* and *C. mingii*), 10 petals (vs. 9–13 in *C. pubipetala*, 12–13 in *C. mingii* and 12 in *C. tuyenquangensis*), cylindrical ovary (vs. ovoid in *C. mingii* and *C. tuyenquangensis*, spherical in *C. pubipetal*) and style 3-lobed to 1/6 style length (vs. 3 (or 4)-cleft to 1/3 style length in *C. pubipetala*, 3-cleft to 1/10 style length in *C. mingii*, 3-cleft to 1/2 style length in *C. tuyenquangensis*). The comparisons between *C. debaoensis* and these species are provided in Table 2. Based on hairs, lamina length, flower size, number of carpels and other characteristics, the new species is also a taxonomic entity distinct from *C. oconariana*, *C. thuongiana*, *C. luteocerata*, *C. luteopallida*, *C. bugiamapensis* and *C. capitata* (Table 1).

**Table 2.** Morphological comparison of *C. debaoensis* with *C. pubipetala*, *C. mingii* and *C. tuyenquangensis*.

| Items | *C. debaoensis* | *C. pubipetala* | *C. mingii* | *C. tuyenquangensis* |
|---|---|---|---|---|
| Young branches | Glabrous | Gray spreading villous | Densely spreading yellowish villous | Glabrous |
| Leaf | Ovate to long ovate, 6.0–13 × 2.5–5.0 cm, abaxial veins sparsely spreading villous, secondary veins 5–6 | Elliptic-ovate, 10.0–17.0 × 5.0–8.0 cm, abaxial appressed villous but densely spreading villous along midvein, secondary veins 8–10 | Elliptic-ovate to narrowly ovate, 10.0–15.0 × 4.0–6.0 cm, abaxial densely spreading villous along veins, secondary veins 7–10 | Oblong ovate to narrow elliptic, 14.0–18.0 × 5.0–8.0 cm, abaxial glabrous, secondary veins 9–11 |
| Petiole | 5–12 mm long, glabrous | 5–10 mm long, villous | 5–7 mm long, densely villous | 10–15 mm long, glabrous |
| Pedicel length | 4 (–6) mm | 3–5 mm | 3–6 mm | 10 mm |
| Sepals | Glabrous | Densely puberulent | Inside densely puberulent | Glabrous |
| Petals | 10, glabrous | 9–13, outside gray puberulent, inside glabrous | 12 or 13, puberulent on both surfaces | 12, glabrous |
| Stamens | 2.0 cm long, glabrous | 2.5–3.0 cm long, distinct part pilose | 3.0 cm long, puberulent | 2.5–3.0 cm long, glabrous |
| Ovary | Cylindrical, glabrous | Spherical, densely tomentose | Ovoid, densely tomentose | Ovoid, glabrous |
| Style | 2 cm long, apex 3-lobed to 1/6 style length, glabrous | Apically 3 (or 4)-lobed to 1/3 style length, tomentose | 3.0 cm long, apex 3-cleft to 1/10 style length, glabrous | 3 cm long, apex 3-cleft to 1/2 style length, glabrous |

## Key to identification of species of yellow camellia with connate style

1 Ovary 3 carpellate, style 3-parted; if ovary 3 (or 4) carpellate, style 3 (or 4)-parted, young branches and leaves spreading villous (*C. pubipetala*) .. **2**
– Ovary 4–6 carpellate, style (3–) 4–6-parted ..... **8**
2 Petals 9–14 ..... **3**
– Petals 6 ..... ***C. capitata***
3 Young branches, petiole, petals, stamens, ovary and style piliferous ..... **4**
– Young branches, petiole, petals, stamens, ovary and style glabrous ..... **5**
4 Petals puberulent on both sides, suborbicular ..... ***C. mingii***
– Petals adaxial puberulent, inside glabrous, elliptic ..... ***C. pubipetala***
5 Petals with dense appressed brown hairs; style with dense white appressed hairs ..... ***C. luteopallida***
– Petals and style glabrous ..... **6**
6 Leaf 6–13 × 2.5–5 cm, abaxial veins sparsely spreading villous, secondary veins 5–6; ovary cylindrical; style apex 3-lobed to 1/6 the length of style ..... ***C. debaoensis***
– Leaf glabrous; style apex 3-cleft to 1/2 the length of style ..... 7
7 Stamens 2.5–3 cm long; style 30 mm long ..... ***C. tuyenquangensis***
– Stamens 1.3–1.4 cm long; style 8–9 mm long ..... ***C. thuongiana***
8 Leaf secondary veins 8–11; pedicel sessile, 1–5 mm long ..... **9**
– Leaf secondary venation 24 pairs; pedicel 30–40 mm long .... ***C. oconoriana***
9 Petals 9–11, with margins sparsely ciliate; style finely tomentose ..... ***C. bugiamapensis***
– Petals 11–13, outer 5-petaloid concave; style glabrous ..... ***C. luteocerata***

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## References

Chang HT, Ren SX (1998) Theaceae. In: Wu CY (Ed.) Flora Reipublicae Popularis Sinicae, vol. 49(3). Science Press, Beijing, 101–112.

Dung LV, Son HT, Ninh T, Nhan PH (2016) *Camellia quangcuongii* (Theaceae), a new species from Vietnam. Shokubutsu Kenkyu Zasshi 91: 226–230.

He DY, Li XY, Wang LL, Zhang P, Li SY, Xu YP (2016) Chemical constituents and pharmacological effects of *Camellia nitidissima*. Zhongguo Shiyan Fangjixue Zazhi 22: 231–234.

Hou MF, López-Pujol J, Qin HN, Wang LS, Liu Y (2010) Distribution pattern and conservation priorities for vascular plants in Southern China: Guangxi Province as a case study. Botanical Studies (Taipei, Taiwan) 51: 377–386.

Huang LD, Liang SY, Ye CX (2014) A new species of *Camellia* from Guangxi, China. Journal Guangdong Landscape Architecture 36: 69–70.

IUCN (2017) Guidelines for using the IUCN red list categories and criteria. Version 13. Prepared by the standards and petitions subcommittee.

Le NHN, Uematsu C, Katayama H, Nguyen LT, Tran N, Luong DV, Hoang ST (2017) *Camellia tuyenquangensis* (Theaceae), a new species from Vietnam. Korean Journal of Plant Taxonomy 47(2): 95–99. https://doi.org/10.11110/kjpt.2017.47.2.95

Liu ZW, Fang W, Liu ED, Zhao M, He YF, Yang SX (2019) *Camellia mingii*, a new species of yellow camellias from Southeast Yunnan, China. Phytotaxa 393(1): 047–056. https://doi.org/10.11646/phytotaxa.393.1.4

López-Pujol J, Zhang FM, Sun HQ, Ying TS, Ge S (2011) Centres of plant endemism in China: Places for survival or for speciation? Journal of Biogeography 38(7): 1267–1280. https://doi.org/10.1111/j.1365-2699.2011.02504.x

Luong VD, Le NHN (2016) *Camellia ninhii* – a new yellow camellia species from Vietnam. International Camellia Journal 48: 117.

Luong VD, Luu HT, Nguyen TQT, Nguyen QD (2016a) *Camellia luteopallida* (Theaceae), a new species from Vietnam. Annales Botanici Fennici 53(1–2): 135–138. https://doi.org/10.5735/085.053.0224

Luong VD, Le A, Nguyen TH, Nguyen TL (2016b) *Camellia thuongiana* – A new yellow camellia species from Vietnam. Dalat University Journal of Science 6(3): 338–344.

Luu HT, Luong VD, Nguyen QD, Nguyen TQT (2015) *Camellia sonthaiensis* (Theaceae), a new species from Vietnam. Annales Botanici Fennici 52(5–6): 289–295. https://doi.org/10.5735/085.052.0502

Min TL (2000) Monograph of the genus *Camellia*. Yunnan Science & Technology Press, Kumming, 78–239.

Min TL, Bruce B (2007) Theaceae. In: Wu ZY, Raven PH, Hong DY (Eds) Flora of China. Science Press (Beijing) and Missouri Botanical Garden Press (St. Louis), 366–478.

Myers N, Mittermeier RA, Mittermeier CG, Fonseca GAB, Kent J (2000) Biodiversity hotspots for conservation priorities. Nature 403(6772): 853–858. https://doi.org/10.1038/35002501

Nguyen LT, Tran N, Chiyomi U, Hironori K, Luong DV, Hoang ST, Nguyen KD, Nguyen HV, Thai TC (2018) Two new species of *Camellia* (Theaceae) from Vietnam. Korean Journal of Plant Taxonomy 48(2): 115–122. https://doi.org/10.11110/kjpt.2018.48.2.115

Orel G (2006) A new species of *Camellia* section *Piquetia* (Theaceae) from Vietnam. Novon 16(2): 244–247. https://doi.org/10.3417/1055-3177(2006)16[244:ANSOCS]2.0.CO;2

Orel G, Curry AS (2015) In pursuit of hidden camellias: 32 New *Camellia* Species from Vietnam and China. Theaceae Exploration Associates, Sydney, 339 pp.

Orel G, Wilson PG (2010) *Camellia luteocerata* sp. nov. and a new section of *Camellia* (*Dalatia*) from Vietnam. Nordic Journal of Botany 28(3): 281–284. https://doi.org/10.1111/j.1756-1051.2010.00652.x

Orel G, Wilson PG (2012) *Camellia cattienensis*: a new species of *Camellia* (sect. *Archaecamellia*: Theaceae) from Vietnam. Kew Bulletin 66(4): 565–569. https://doi.org/10.1007/s12225-012-9317-0

Orel G, Wilson PG, Curry AS, Luu HT (2012) *Camellia inusitata* (Theaceae), a new species forming a new section (*Bidoupia*) from Vietnam. Edinburgh Journal of Botany 69(2): 347–355. https://doi.org/10.1017/S0960428612000170

Orel G, Wilson PG, Curry AS, Luu HT (2013) *Camellia oconoriana* (Theaceae), a new species from Vietnam. Edinburgh Journal of Botany 70(3): 439–447. https://doi.org/10.1017/S0960428613000103

Orel G, Wilson PG, Curry AS, Truong LH (2014a) Four new species and two new sections of *Camellia* (Theaceae) from Vietnam. Novon 23(3): 307–318. https://doi.org/10.3417/2012076

Orel G, Wilson PG, Luu HT (2014b) *Camellia curryana* and *C. longii* spp. nov. (Theaceae) from Vietnam. Nordic Journal of Botany 32(1): 42–50. https://doi.org/10.1111/j.1756-1051.2013.00399.x

Qin HN, Yang Y, Dong SY, He Q, Jia Y, Zhao L, Yu S, Liu H, Liu B, Yan Y, Xiang J, Xia N, Peng H, Li Z, Zhang Z, He X, Yin L, Lin Y, Liu Q, Hou Y, Liu Y, Liu Q, Cao W, Li J, Chen S, Jin X, Gao T, Chen W, Ma H, Geng Y, Jin X, Chang C, Jiang H, Cai L, Zang C, Wu J, Ye J, Lai Y, Liu B, Lin Q, Xue N (2017) Threatened Species List of China's Higher Plants. Shengwu Duoyangxing 25(7): 696–744. https://doi.org/10.17520/biods.2017144

Thiers B (2018) Index Herbariorum: A global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium.

Tran N, Le NHN (2015) A new yellow *Camellia* species from North Vietnam. International Camellia Journal 47: 36–39.

Tran N, Luong VD (2013) *Camellia dilinhensis*: A new species from Vietnam. Internal Camellia Journal 45: 87–89.

Tran N, Nguyet HN (2005) *Camellia hamyenensis*: A new yellow species from Vietnam. Internal Camellia Journal 37: 125–127.

Tran N, Hakoda N, Luong VD (2012) A new species of yellow camellias (Sect. *Piquetia*) from Vietnam. Internal Camellia Journal 44: 161–162.

Tran DM, Nguyen TT, Hoang TS, Dang VT, Phung DT, Nguyen VT, Dao TD, Mai TL, Vu TL, Nguyen HT, Nguyen TTP, Tran VD (2019) Golden Camellia: A review. Archives of Current Research International 16(2): 1–8. https://doi.org/10.9734/acri/2019/v16i230085

Ye CX, Xu ZR (1992) A taxonomy *Camellia* Sect. *Chrysantha* Chang. Acta Scientiarum Naturalium Universitatis Sunyatseni 31: 68–77.